REMARKS

35 U.S.C. 112 and 35 U.S.C. 132 Rejections

Claims 1, 3, 5-11, 13-18, and 20-23 have been rejected under 35 U.S.C. 112 and 35 U.S.C. 132. The Office Action contends that "wherein the fluidized bed conveyor is an air slide" is new matter in the independent claims, and that Claims 21-23 "would also appear to be new matter".

The fluidized bed conveyor as being an air slide is described at page 12, lines 18-20 of the specification. The "sloping" floor of claims 21-23 has a basis at page 12, line 11 of the specification.

It is respectfully requested that this rejection be withdrawn.

35 U.S.C. 103(a) Rejections

Claims 1, 3, 5-11, 13-18 and 20 were rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 5,556,447 to Srinivasachar *et al.*, U.S. Patent No. 5,245,120 to Srinivasachar *et al.*, U.S. Patent No. 5,803,663 to Matsuyama *et al.*, U.S. Patent No. 6,390,851 to Siddle, U.S. Patent No. 6,416,567 to Edlund *et al.*, "Regeneration of activated carbon used in the adsorption of mercury and organomercury compounds in waste gases" to Zemskov *et al.*, EP 380467 to Fercher *et al.*, JP 04-061981 to Fujita, JP 07-155722 to Hamaguchi *et al.*, JP 07-155723 to Hamaguchi *et al.*, DE 19801321 to Hoermeyer *et al.*, JP 2003-154233 to Okada, and Research Disclosure 470003 "Treatment of mercury in fly ash by the CBO process" to Cochran *et al.*, alone or in view of U.S. Patent No. 5,280,701 to Tolman, and line 6, page 8 of Applicants' specification. In view of the remarks below, reconsideration is respectfully requested.

In independent claims 1, 11 and 18, the claimed methods include the step of depositing the material being treated (e.g., activated carbon) on an air slide floor having openings and passing heated flowing air through the openings to move the amount of sorbent from a beginning to an exit area of the air slide. The claimed method is advantageous in that the material being treated is conveyed and treated at the same time. It is submitted that this feature of independent claims 1, 11 and 18 is not shown or suggested in the cited references.

An air slide is one way to move particulate materials such as fly ash and activated carbon. However, conventional air slides operate at ambient or the handled material's temperature without heat input. In the present invention, the air slide has been improved to accept heated flowing air through openings in the air slide floor to move the amount of sorbent from a beginning to an exit area of the air slide, wherein the flowing air is passed through the openings until the particulate matter reaches a temperature of at least 700°F and mercury compounds are liberated from at least some of the particulate matter.

At page 12, lines 18-20 of the specification, Ducon is mentioned as a supplier of air slides. Applicants attach as Exhibit A pictures and a description of an example air slide available from Ducon. Exhibit A can be found at www.ducon.com/dflother.php. It is believed that the air slide recited in independent claims 1, 11 and 18 is not shown or suggested in the cited references.

All of U.S. Patent No. 5,556,447 to Srinivasachar *et al.*, U.S. Patent No. 5,245,120 to Srinivasachar *et al.*, U.S. Patent No. 5,803,663 to Matsuyama *et al.*, U.S. Patent No. 6,399,851 to Siddle, U.S. Patent No. 6,416,567 to Edlund *et al.*, the article

entitled "Regeneration of activated carbon used in the adsorption of mercury and organomercury compounds in waste gases" by Zemskov *et al.*, EP 380467 to Fercher *et al.*, the abstract for JP 04-061981 to Fujita, the abstract for JP 07-155722 to Hamaguchi *et al.*, the abstract for JP 07-155723 to Hamaguchi *et al.*, the abstract for DE 19801321 to Hoermeyer *et al.*, the abstract for JP 2003-154233 to Okada, and the Research Disclosure 470003 entitled "Treatment of mercury in fly ash by the CBO process" by Cochran *et al.* do not teach or suggest moving the material being treated along a conveyor by way of an air slide during the heating as recited in independent claims 1, 11 and 18.

U.S. Patent No. 5,280,701 to Tolman is cited as describing the use of a "fluidized bed combustor". However, a fluidized bed combustor is not an air slide. In this regard, Applicants attach Exhibit B, an article from the U.S. Department of Energy website, which notes that fluidized bed combustion takes place in a boiler. Thus, Tolman also does not teach or suggest an air slide as recited in independent claims 1, 11 and 18.

Therefore, it is respectfully submitted that all of the elements and limitations of independent claims 1, 11 and 18 are not shown or suggested in the cited references. Accordingly, it is believed that independent claims 1, 11 and 18 (and the remaining claims that depend thereon) are patentable over the cited references. ("To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)" cited at M.P.E.P. § 2143.03).

The Applicants note the contention in the Office Action that the use of an air slide "would appear to be an obvious design choice modification for one of ordinary skill in

the art familiar with fluidized bed combustion and conveyance of heated material". However, it is well settled that "when patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness." *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002). Furthermore, "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed" *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000).

It respectfully submitted that the Office Action comment that the use of an air slide "would appear to be an obvious design choice modification" does not adequately address the issue of motivation to combine or modify. In this regard, the "factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority." *In re Lee*, 277 F.3d at 1343-1344.

Conclusion

It is believed that the entire application is in condition for allowance. If any fees are needed, please charge them to deposit account 17-0055.

Respectfully submitted,

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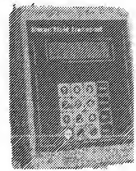
enclosure. The solid state electronics panel is state-of-the-art technology and has provisons to stop the cycle from high level in day tank or storage bin.

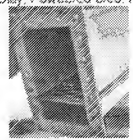


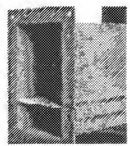
DU-SLIDE Conveyors

DU-SLIDE Conveyors are used to convey products from one point to another via air

They are made of heavy gauge steel sectionsbolted to be air tight in 10 ft. sections. Air enters the clean air plenum and passes through a porous membrane of thick polyester filter material (The filter material can be a porous cotton or metal membrane). The aeration of the product causes it to act like a fluid and gently slide along the gradual slope of the slide. Air pressure and volume is varied according to the design requirement.

The entire DU-SLIDE unit is dust-tight, enclosed and of low cost construction. It is largely pre-assembled, and has no drives, gears or precision parts. It is ideal for handling materials such as: Alumina, Cement, Hydrated lime, Barites, Flour, Starch, Flyash, Clay, Powdered ores, PVC resin etc.





DU-SILO Fluidizer

Duron provides Silo fluidizers for both flat and cone bottom silos. All fluidizers are custom designed for each material.

APPLICANT'S EXHIBIT A

APPLICANT'S EXHIBIT B

Fluidized Bed Technology - Overview

MORE INFO
- Fluidized Bed - An R&D Success Story
- The Jacksonville (FL) Fluidized Bed Power Plant (Opens new browser window)

Fluidized beds suspend solid fuels on upward-blowing jets of air during the combustion process. The result is a turbulent mixing of gas and solids. The tumbling action, much like a bubbling fluid, provides more effective chemical reactions and heat transfer.

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Fluidized-bed combustion evolved from efforts to find a combustion process able to control pollutant emissions without external emission controls (such as scrubbers). The technology burns fuel at temperatures of 1,400 to 1,700 degrees F, well below the threshold where nitrogen oxides form (at approximately 2,500 degrees F, the nitrogen and oxygen atoms in the combustion air combine to form nitrogen oxide pollutants).

The mixing action of the fluidized bed results brings the flue gases into contact with a sulfur-absorbing chemical, such as limestone or dolomite. More than 95 percent of the sulfur pollutants in coal can be captured inside the boiler by the sorbent.

Pressurized fluidized-bed combustion (PFBC) builds on earlier work in atmospheric fluidized-bed combustion technology. Atmospheric fluidized bed combustion is crossing over the commercial threshold, with most boiler manufacturers currently offering fluidized bed boilers as a standard package. This success is largely due to the Clean Coal Technology Program and the Energy Department's Fossil Energy and industry partners' R&D.

The popularity of fluidized bed combustion is due largely to the technology's fuel flexibility - almost any combustible material, from coal to municipal waste, can be burned - and the capability of meeting sulfur dioxide and nitrogen oxide emission standards without the need for expensive add-on controls.

The Clean Coal Technology Program led to the initial market entry of 1st generation pressurized fluidized bed technology, with an estimated 1000 megawatts of capacity installed worldwide. These systems pressurize the fluidized bed to generate sufficient flue gas energy to drive a gas turbine and operate it in a combined-cycle.

The 1st generation pressurized fluidized bed combustor uses a "bubbling-bed" technology (The joint Energy Department-American Electric Power Clean Coal Technology project at the Tidd Plant in Ohio used bubbling

bed technology). A relatively stationary fluidized bed is established in the boiler using low air velocities to fluidize the material, and a heat exchanger (boiler tube bundle) immersed in the bed to generate steam. Cyclone separators are used to remove particulate matter from the flue gas prior to entering a gas turbine, which is designed to accept a moderate amount of particulate matter (i.e., "ruggedized").

A 2nd generation pressurized fluidized bed combustor uses "circulating fluidized-bed" technology and a number of efficiency enhancement measures. Circulating fluidized-bed technology has the potential to improve operational characteristics by using higher air flows to entrain and move the bed material, and recirculating nearly all the bed material with adjacent high-volume, hot cyclone separators. The relatively clean flue gas goes on to the heat exchanger. This approach theoretically simplifies feed design, extends the contact between sorbent and flue gas, reduces likelihood of heat exchanger tube erosion, and improves SO_2 capture and combustion efficiency.

A major efficiency enhancing measure for 2nd generation pressurized fluidized bed combustor is the integration of a coal gasifier (carbonizer) to produce a fuel gas. This fuel gas is combusted in a topping combustor and adds to the combustor's flue gas energy entering the gas turbine, which is the more efficient portion of the combined cycle. The topping combustor must exhibit flame stability in combusting low-Btu gas and low-NOx emission characteristics. To take maximum advantage of the increasingly efficient commercial gas turbines, the high-energy gas leaving the topping combustor must be nearly free of particulate matter and alkali/sulfur content. Also, releases to the environment from the pressurized fluid bed combustion system must be essentially free of mercury, a soon-to-be regulated hazardous air pollutant.

To reduce cost and carbon dioxide emissions, new sorbents are being evaluated. Sorbent utilization has a major influence on operating costs, and carbon dioxide emissions streams can result in the production and use of alkali-based sorbents.

Efforts are ongoing at the Power Systems Development Facility (PSDF) in Wilsonville, Alabama to assure critical components and subsystems are ready for demonstration of 2nd generation pressurized fluidized bed combustion. The PSDF is operated by Southern Company Services under DOE contract to conduct cooperative R&D with industry.

Tests conducted at the PSDF in 1998 verified that a newly developed multi-annular swirl burner (MASB) provided the needed flame stability and low-NOx performance characteristics. Tests of promising new hot gas filter components and systems are continuing at the PSDF. Advances made to date in this critical technology area include the development of clay-bonded silicon carbide candle filters and the associated filter vessel. Efforts are currently focused on improved candle filter materials for enhanced durability under extreme temperatures and corrosive environment. New ceramics and ceramic-metallic composites are showing promise. Those passing laboratory screening tests will undergo testing at the PSDF.